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BOOK REVIEWS AND NOTES.

NATURAL PHILOSOPHY. By *Wilhelm Ostwald*. Translated by *Thomas Seltzer*. New York: Henry Holt & Co., 1910. Pp. 193. Price \$1.00 net.

Under this title appears an English translation of Ostwald's treatise on nature philosophy as distinct from academic philosophy. The book is well translated and we propose to characterize Ostwald's philosophy by a series of quotations.

Professor Ostwald says:

"The present work is meant to serve as the first aid and guide in the acquisition of these comprehensive notions of the external world and the inner life. It is not meant to develop or uphold a system of philosophy.' Through long experience as a teacher the writer has learned that those are the best pupils who soon go their own way. However, it is meant to uphold a certain method, that is, the scientific (or, if you will, the natural scientific), which takes its problems, and endeavors to solve its problems, from experience and for experience."

Professor Ostwald opposes science for the sake of science. He says:

"Mere knowledge of the past which is not meant to, or cannot, serve as a basis for shaping the future is utterly aimless knowledge, and must take its place with other aimless activities called play."

Concerning scientific concepts Ostwald says:

"The laws of nature do not decree what shall happen, but inform us what has happened and what is wont to happen. The knowledge of these laws, therefore, makes it possible for us, as I have emphasized again and again, to foresee the future in a certain degree and, in some measure, also to determine it. . . . We may expect that if in a given specimen of water we discover a relation which up to that time was unknown, we shall find this relation also in all the other specimens of water even though they were not tested for that particular relation. It is obvious how enormously this facilitates the progress of science. For it is only necessary to determine this new relation in some one case accessible to the investigator to enable us to predict the same relation in all the other cases without subjecting them to a new test. As a matter of fact, this is the general method that science pursues. It is this that makes it possible for science to make regular and generally valid progress through the labors of the most various investigators who work independently of one another, and often know nothing of one another. Of course, it must not be forgotten that such conclusions are always obtained in accordance with the following formula: things have been so until now, therefore we expect that

they will be so in the future. In every such case, therefore, there is the possibility of error. Thus far, whenever an expectation was not realized, it was almost always possible to find an 'explanation' for the error."

Concerning causation Professor Ostwald is rather didactic. He says:

"If by experience we have found a proposition of the content, 'If A is, then B is also,' the two concepts A and B generally consist of several elements which we will designate as a, a', a'', a''' , etc., and as b, b', b'', b''' . Now the question arises, whether or not all these elements are essential for the relation in question.... The general method of convincing oneself of this is by eliminating one by one the component parts of the concept A, namely, a, a', a'' , etc., and then seeing whether B still appears. It is not always easy to carry out this process of elimination.... We must multiply the experiences as much as possible in order to determine what constant elements are found in the concept B, and to form from these constant elements the corresponding concept B'. The improved proposition will then read: if A' is, then B' is also. This entire process may be called the purification of the causal relation."

He solves the problem of free will in this way:

"Essentially there is no objection to be found to a fundamental determinism which explains that this feeling of freedom is only a different way of saying that a part of the causal chain lies within our consciousness, and that we feel these processes (in themselves determined) as if we ourselves determined their course."

Apparently he is not a friend of the science of language, for he thus takes philology to task:

"The unwarranted importance attached to the historical study of language forms is paralleled by the equally unwarranted importance ascribed to grammatical and orthographic correctness in the use of language. This perverse pedantry has been carried to such lengths that it is considered almost dishonorable for any one to violate the usual forms of his mother tongue, or even of a foreign language like the French. We forget that neither Shakespeare nor Luther nor Goethe spoke or wrote a 'correct' English or German, and we forget that it cannot be the object of a true cultivation of language to preserve as accurately as possible existing linguistic usage, with its imperfections, amounting at times to absurdities. Its real object lies rather in the appropriate development and improvement of the language."

His love of an international artificial language finds expression on pages 100-101:

"A twofold advantage will have been attained by the introduction of a universal auxiliary language. Recently the efforts in that direction have made considerable progress. In the first place it will provide a general means of communication in all matters of common human interest, especially the sciences. This will mean a saving of energy scarcely to be estimated. In the second place, the superstitious awe of language and our treatment of it will give way to a more appropriate evaluation of its technical aim. And when by the help of the artificial auxiliary language, we shall be able to convince ourselves daily how much simpler and completer such a language can be made than are the 'natural' languages, then the need will irresistibly assert itself to have these languages also participate in its advantages. The consequences of such progress to human intellectual work in general would be

extraordinarily great. For it may be asserted that philosophy, the most general of all the sciences, has hitherto made such extremely limited progress only because it was compelled to make use of the medium of general language."

Professor Ostwald recurs to the subject once more on page 183, where in a footnote he declares himself in favor of Ilo as against Esperanto which, he predicts, "must inevitably die out."

His theory of time and space may be characterized in the following quotation:

"The properties of time are of so simple and obvious a nature that there is no special science of time. What we need to know about it appears as part of physics, especially of mechanics....

"As for space, the presence of the three dimensions conditions a great manifoldness of possible relations, and hence the existence of a very extensive science of bodies in space, of geometry. Geometry is divided into various parts depending upon whether or not the concept of measurement enters. When dealing with purely spacial relations apart from the concept of measurement it is called geometry of position. In order to introduce the element of measurement a certain hypothesis is necessary which is undemonstrable, and therefore appears to be arbitrary and can be justified only because it is the simplest of all possible hypotheses. This hypothesis takes for granted that a rigid body can be moved in all directions in space without changing in measure. Or, to state the inverse of this hypothesis, in space those parts are called equal which a rigid body occupies, no matter how it is moved about.

"We are not conscious of the extreme arbitrariness of this assumption simply because we have become accustomed to it in school. But if we reflect that in daily experience the space occupied by a rigid body, say a stick, seems to the eye to undergo radical changes as it shifts its position in space and that we can maintain that hypothesis only by declaring these changes to be 'apparent,' we recognize the arbitrariness which really resides in that assumption. We could represent all the relations just as well if we were to assume that those changes are real, and that they are successively undone when we restore the stick to its former relation in our eye. But though such a conception is fundamentally practicable in so far as it deals merely with the space picture of the stick, we nevertheless find that it would lead to such extreme complications with regard to other relations (for example, the fact that the weight of the stick is not affected by the change of the optic picture) that we do better if we adhere to the usual assumption that the optical changes are merely apparent."

Professor Ostwald opposes the mediumistic explanation of nature. He says:

"All natural phenomena can ultimately be conceived as the motion of matter. Through the greater part of the nineteenth century this conception, called scientific materialism, was accepted almost without opposition. At present it is being more and more recognized that it was only an unproved assumption, which the development of science daily proves to be more untenable."

We search in vain for a definition of the soul. But our author speaks of organisms as "extremely specialized individual instances of physico-chem-

ical mechanics," and what takes the place of the soul appears to be in his philosophy, "adaptation or memory." He says:

"It is the property which we have called memory, and which we will define in a very general way as the quality by virtue of which the repetition in organisms of a process which has taken place a number of times is preferred to new processes, because it originates more easily and proceeds more smoothly. It is readily apparent that by this property the organisms are enabled to travel on the sea of physical possibilities as if equipped with a keel, by which the voyage is made stable and the keeping of the course assured."

Professor Ostwald raises the question, Is there a standard in the scale of organisms? and answers it thus:

"Since our opinion as to what constitutes a higher and a lower organism is doubtless arbitrary, let us ask whether it is not possible to find an objective standard by which to measure the relative perfection of the different organisms."

Concerning civilization he says:

"Everything which serves the social progress of mankind is appropriately called civilization or culture, and the objective characteristic of progress consists in improved methods for seizing and utilizing the raw energies of nature for human purposes. Thus it was a cultural act when a primitive man discovered that he could extend the radius of his muscle energy by taking a pole in his hand. . . . And at the other end of the scale of civilization the most abstract scientific discovery, by reason of its generalization and simplification, signifies a corresponding economy of energy for all the coming generations that may have anything to do with the matter. Thus, in fact, the concept of progress as here defined embraces the entire sweep of human endeavor for perfection, or the entire field of culture, and at the same time it shows the great scientific value of the concept of energy."

According to Professor Ostwald, man is not yet civilized, for he continues:

"If we examine our present social order from this point of view, we realize with horror how barbarous it still is. Not only do murder and war destroy cultural values without substituting others in their place, not only do the countless conflicts which take place between the different nations and political organizations act anticulturally, but so do also the conflicts between the various social classes of one nation, for they destroy quantities of free energy which are thus withdrawn from the total of real cultural values. . . . We are living at a time when men are gradually approximating one another very closely in their natures, and when the social organization therefore demands and strives for as thorough an equalization as possible in the conditions of existence of all men."

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ÉLÉMENTS DE CALCUL VECTORIEL. Par C. Burali-Forti et R. Marcolongo. Translated from the Italian by S. Lattès. Paris: A. Hermann, 1910. Pp. 230. Price 8 fr.

The vectorial calculus is here studied in relation to its many applications to geometry, mechanics and mathematical physics. Part one treats of real numbers, points, vectors, and Grassmann's forms of primary space. The second part presents applications of this vectorial system which the authors

call the "minimum system," and illustrations are chosen to show the great superiority of the absolute vectorial calculus over the old indirect methods of coordinates.

DAS ERKENNTNISPROBLEM IN DER PHILOSOPHIE UND WISSENSCHAFT DER NEUEREN ZEIT. Von *Ernst Cassirer*. Berlin: Bruno Cassirer, 1911. Pp. 601.

The first volume of this scholarly work of Dr. Ernst Cassirer, of the University of Berlin, has now appeared in a second edition. The author has enlarged upon and to some extent modified his views since they were presented in the first edition. The problems of thought appear to him no longer as rigid ready formations which are going to stand forever, but as instruments of thought. The absolute has disappeared, and the creations of thought appear in their historical relativity as conditioned by their time and their surroundings. The present volume has been revised and supplemented in many places, and in the second volume certain sections have been thoroughly rewritten and show considerable change of view, for instance the chapter on Gassendi.

The work begins with the age of the Renaissance, starting with Nikolaus Cusanus. It discusses in the second part the discovery of the concept of nature, and in the third part the foundation of idealism. The second volume may soon be expected.

RAZIONALISMO E MISTICISMO. Da *Michele Losacco*. Milan: Libreria Editrice Milanese, 1911. Pp. 259. Price 3.50 lire.

This is a collection of essays and sketches most of which have appeared in various Italian philosophical and literary periodicals. They show considerable familiarity with general European thought. Following an introductory essay on "Rationalism and Mysticism" the author gives first his opinion on the Origin of Natural Philosophy, then discusses in turn the revival of mysticism, the theory of objects and rationalism, rationalism and "intuitionism" including a critique of Bergson and Schmitt as representatives of the latter school. The last of the essays is a hitherto unpublished treatment of Jakob Böhme in the light of the latest criticism and his own *Aurora*.

The sketches are more diversified in object matter though most of them are more or less in the general character of reviews, and many of them are of purely local interest. Their titles are fairly indicative of their scope: "A New Book on Hegel" discusses a work now nearly four years old by the Italian B. Croce; "The Thinker Leopardi" is called forth by an Italian work of Gatti on this philosophical writer; "The Anti-Metaphysical Prejudice" is a brief history of the opposition to metaphysicism; "Facts and Laws in Human Affairs" treats of the uniformities noticeable among the diverse isolated facts of history; "Nietzsche and Tragedy" discusses the light thrown on Nietzsche's personality by his "Origin of Tragedy" recently translated into Italian; "A Successor of Pascal" is the French Priest Laberthonnière; then follow "The Magician of the North" (J. G. Hamann); "Franciscan Studies," a review of a book by F. Tocco; "The Circulation of Italian Thought"; "B. Croce and his Philosophy of Practice"; "Delacroix and his Studies in Mysticism"; "*Le Philosophie Inconnu*"; "The Greatest Problems of Varisco" and "Maschi's Conception of Religion."